

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICENATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY

RECEIVED

DATE ENTERED

SEE INSTRUCTIONS IN HOW TO COMPLETE NATIONAL REGISTER FORMS
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS**1 NAME**

HISTORIC

Eads Bridge

AND/OR COMMON

Eads Bridge

2 LOCATIONSTREET & NUMBER Crosses the Mississippi River from Washington Ave, St. Louis, MO
to Broadway, East St. Louis, IL

CITY, TOWN

St Louis

VICINITY OF

STATE

Missouri

CODE

29

NOT FOR PUBLICATION

CONGRESSIONAL DISTRICT

COUNTY

St. Louis

CODE

510

3 CLASSIFICATION

CATEGORY

☐ DISTRICT☐ BUILDING(S)☒ STRUCTURE☐ SITE☐ OBJECT

OWNERSHIP

☒ PUBLIC☐ PRIVATE☐ BOTH

PUBLIC ACQUISITION

☐ IN PROCESS☐ BEING CONSIDERED

STATUS

☒ OCCUPIED☐ UNOCCUPIED☐ WORK IN PROGRESS

ACCESSIBLE

☐ YES: RESTRICTED☒ YES: UNRESTRICTED☐ NO

PRESENT USE

☐ AGRICULTURE☐ COMMERCIAL☐ EDUCATIONAL☐ ENTERTAINMENT☐ GOVERNMENT☐ INDUSTRIAL☐ MILITARY☐ MUSEUM☐ PARK☐ PRIVATE RESIDENCE☐ RELIGIOUS☐ SCIENTIFIC☒ TRANSPORTATION☐ OTHER:**4 OWNER OF PROPERTY**

NAME

Terminal Railroad Association of St. Louis

STREET & NUMBER

906 Olive Street

CITY, TOWN

St. Louis

VICINITY OF

STATE

Missouri

5 LOCATION OF LEGAL DESCRIPTIONCOURTHOUSE,
REGISTRY OF DEEDS, ETC.

Assessor's Office, City Hall

STREET & NUMBER

Room 114, 12th and Market Streets

CITY, TOWN

St. Louis,

STATE

Missouri

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

Historic American Buildings Survey

DATE

1968

☒ FEDERAL ☐ STATE ☐ COUNTY ☐ LOCALDEPOSITORY FOR
SURVEY RECORDS

Library of Congress/Prints and Photographs Division

CITY, TOWN

Washington

STATE

D.C.

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
<input type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input checked="" type="checkbox"/> UNALTERED	<input checked="" type="checkbox"/> ORIGINAL SITE
<input checked="" type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input type="checkbox"/> ALTERED	<input type="checkbox"/> MOVED DATE _____
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

Eads Bridge spans the Mississippi River at St. Louis, Missouri, crossing from Washington St. in St. Louis to Broadway in East St. Louis, Illinois. It is a three span, ribbed steel arch bridge, with lower and upper decks and granite-faced limestone piers. Materials used in the construction include 2390 tons of steel, 3156 tons of wrought iron, 806 tons of timber decking, 4556 cubic yards of concrete, and 97,571 cubic yards of stone masonry. The center span is 520 feet, the other two spans are 502 feet, and the overall length including approaches on both sides is 6442 feet. The bridge clearance is 50 feet above high water.

The piers are constructed of limestone below the average high water mark and of granite above this level. The east abutment rises 193 feet from bedrock, the west abutment, 113 feet. The east pier, which is the deepest, is 197 feet from bedrock, and the west pier is 172 feet.

There are small masonry arches on the approaches to the bridge, mostly on the lower level and larger arches on the street level next to the river. The highway deck, which is 54 feet wide, is supported by concrete foundations, and runs across the top of the bridge. Only a small portion of the original railing exists, on the north side of the eastern approach. The lower deck carried dual railroad tracks which were removed in 1974. Some of the wooden ties remain on the bridge. The railroad tracks emerged from the lower deck of the bridge on the Illinois (east) side and ran above the road upon reaching the embankment.

Connected to the bridge on the west side is a 4095 foot tunnel which runs under Washington St. and 8th Ave. to Clark St. in St. Louis. The tunnel is approximately 16.5 feet high with two interior bores five to six feet wide. The floor of the tunnel is about 20 feet below street level and the tunnel makes close to a 90° turn at the corner of 8th and Washington. The tunnel entrance at Clark St. is rectangular and lined with granite or limestone blocks, while the two inner bores are arched with granite or limestone blocks. The tunnel roof is flat and the walls appear to be finished with concrete. The tracks were removed from the tunnel in 1974, although some wooden ties still remain.

The combined length of the tunnel and bridge is approximately 2 miles.

7. Description

Condition		Check one	Check one
<input type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input checked="" type="checkbox"/> unaltered	<input checked="" type="checkbox"/> original site
<input checked="" type="checkbox"/> good	<input type="checkbox"/> ruins	<input type="checkbox"/> altered	<input type="checkbox"/> moved date _____
<input type="checkbox"/> fair	<input type="checkbox"/> unexposed		

Describe the present and original (if known) physical appearance

Eads Bridge spans the Mississippi River at St. Louis, Missouri, crossing from Washington St. in St. Louis to Broadway in East St. Louis, Illinois. It is a three span, ribbed steel arch bridge, with lower and upper decks and granite-faced limestone piers. Materials used in the construction include 2390 tons of steel, 3156 tons of wrought iron, 806 tons of timber decking, 4556 cubic yards of concrete, and 97,571 cubic yards of stone masonry. The center span is 520 feet, the other two spans are 502 feet, and the overall length including approaches on both sides is 6442 feet. The bridge clearance is 50 feet above high water.

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The length of the bridge is approximately 1 mile.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input checked="" type="checkbox"/> TRANSPORTATION
<input type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)
		<input type="checkbox"/> INVENTION		

SPECIFIC DATES 1867-1874

BUILDER/ARCHITECT Captain James B. Eads

STATEMENT OF SIGNIFICANCE

Eads Bridge was designed and built by Captain James B. Eads (1820-1887) to accommodate rail service over the Mississippi River, thus providing a link between railroads running east from East St. Louis, Illinois, and those going west from St. Louis, Missouri. Construction began on the west abutment in August of 1867 and the bridge was completed and dedicated on July 4, 1874, at a cost of \$10,000,000. The addition of a tunnel which ran under the streets of St. Louis from Clark Street to the bridge, brought the total cost of the project to well over \$12,000,000.

The bridge employs a three-span, ribbed steel, deck arch design, and is significant for its design, method of construction, and materials used. Construction utilized cantilever support rather than centering, a technique used most commonly in arch and truss bridges, and featured spans larger than any previously constructed bridge. It wasn't until 1932 that a bridge with larger spans was constructed. Steel was used for the first time as the primary metal on a major structure, and was supplied by the Keystone Bridge Company of Pittsburgh. Eads Bridge was also important as the largest bridge built at that time, with the largest caissons constructed to date, the first significant use of compressed air for subaqueous work, and the deepest compressed air work.

James B. Eads was a hydraulic river engineer. He also built iron clad gunboats for the Union during the Civil War and designed the jetty system at the mouth of the Mississippi River. Eads Bridge was the first bridge that he designed and the only one that he actually built. At one time, Eads ran a salvage business on the river, and as a diver, became familiar with the currents and the composition of the river bottom. Taking into account this knowledge of the river, he proposed to build a bridge over the Mississippi in 1865. Believing that the foundations were the most critical portion of the bridge, Eads was convinced they should rest on the bedrock to assure stability. The bridge structure would require a three-span, ribbed steel arch construction. Based on these preliminary plans, Eads was named the chief engineer of the newly formed St. Louis Bridge Company, and he proceeded to fully develop his plans with a staff of qualified engineers.

A trip to Europe in 1868 resulted in Eads' decision to use a pneumatic caisson system of construction on the piers. This allowed him to reach bedrock 136 feet below high water on the east pier, the deepest pneumatic caisson ever constructed. Eads also improved air lock designs and invented a sand pump that facilitated excavations within the caisson. A portion of the iron used in constructing the piers was salvaged from the wreck of the iron clad gunboat, Milwaukee, sunk by Confederate torpedos, March 1865 in Mobile Bay. The iron caissons were then filled with concrete which formed the foundation of the piers. Caisson disease, or the bends, was a problem encountered by men working in the deep level of the piers. Since little was known about combating the effects of men working in highly compressed air, 119 men developed the disease, and 14 died from it before the

(continued)

**United States Department of the Interior
Heritage Conservation and Recreation Service**

**National Register of Historic Places
Inventory—Nomination Form**

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1

SIGNIFICANCE (continued)

bridge was completed. The caissons of the two river piers reached bedrock in early 1870.

Construction of the superstructure began in April, 1873. Eads had developed a ribbed steel arch, using four pairs of steel tubes for each of the three spans. The lower and upper tubes of each pair were tied together in truss-like form using wrought iron bracings supplied by Andrew Carnegie. The arches cantilevered out from both sides of the river piers to form part of the half-span. Additional tubes were supported by cables strung from temporary towers built on top of the piers, until full half-arches were completed. Arches were closed at the center using a special threaded coupling. Rib construction was completed in less than 14 months.

Adjoining the bridge on the west side is a 4095 foot railroad tunnel which runs under 8th Avenue and Washington Street in St. Louis. An integral portion of the bridge project, construction on the tunnel began in 1873 and was completed by June, 1874. Over 60,000 cubic yards of masonry was used in building the tunnel. Although not built by the Illinois and St. Louis Bridge Company, the same masonry contractor for the bridge worked on part of the masonry in the tunnel, particularly at the west entrance to the tunnel and on the two arches of the inner bores. Little information is available on the actual construction of the tunnel, therefore, it is not known if the tunnel is significant in comparison to other tunnels built at the same time. However, based on the early date (1874) and its importance to the main purpose of the bridge, the tunnel has been included in the district. The tunnel provided the link between the bridge and Union Depot railroad yards in St. Louis, as well as joining railroad lines to the west.

The bridge and tunnel were formally opened on July 4, 1874 with gala festivities marking the occasion. The excitement was shortlived. The tunnel was plagued with numerous problems from the start. The first train through the tunnel scrapped the sides because although the wheel had been converted to standard gauge (4'9"), the body of the train was still broad gauge (6') and too wide for the narrow passage. Heat, smoke, and the smell in the tunnel also bothered passengers traveling in the open cars.

Christened the Illinois and St. Louis Bridge, the name did not last, and neither did the company which owned it. The track which crossed the bridge and tunnel were connected to only one railroad, the St. Louis, Vandalia, and Terre Haute Railroad, and no arrangement had been formally made with that line to send any traffic over the bridge. Other railroads boycotted the bridge following its completion, forcing the Illinois and St. Louis Bridge Company into receivership less than one year after opening. Within four years, the company went bankrupt and the bridge was sold at auction in 1878. An English company named the St. Louis Bridge Company bought the bridge for \$2,000,000, and in 1881, Jay Gould's Missouri Pacific obtained a sole lease on the bridge, assuming all debts. Finally, in 1889, the lease was transferred to a group of railroad companies called the Terminal Railroad Association of St. Louis. This company has owned and operated the bridge ever since. Although the highway part of the bridge is still used, the tracks on the bridge and in the tunnel were removed in 1974. Some ties are still visible in the tunnel and on the lower deck of the bridge.

9. Major Bibliographical References

Art Museum, Dept. of Civil Engineering, Princeton University, The Eads Bridge, 1974.
Mattison, Ray H., "Eads Bridge," Historic Sites Survey Record, 1963.
Smith, Shirley H., The World's Great Bridges. 1953.
Steinmen, David ., and Sarah Ruth Watson, Bridges and Their Builders, 1941.
Work Projects Administration, Missouri--A Guide to the "Show Me" State, 1941.

10. Geographical Data

Acreage of nominated property 6.67 acres

Quadrangle name _____

Quadrangle scale _____

UTM References

A

1	1	3
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7	4	6	2	4	0
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4	1	2	7	1	9	1	1	1	0
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Zone Easting Northing

B

1	1	3
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7	4	5	0	0	0
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4	1	2	7	1	9	1	1	1	0
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Zone Easting Northing

C

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Verbal boundary description and justification

The boundaries of the Eads Bridge NHL are described as follows: Beginning at the lower deck of the western bridge approach. Continue east over the bridge and the eastern approach, ending at a point where the highway returns to solid ground and is no (continued)

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
-------	------	--------	------

state	code	county	code
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11. Form Prepared By

name/title Stephen Lissandrello, Historian, Landmarks Survey Project -updated by Sarah J. Pearce
Historic Sites Survey, National Park Service
organization _____ date March 31, 1975 National Park Service, RMP 7/83

street & number 1100L Street NW 523-5464 telephone 234-2560

city or town Washington, D.C. state Denver, CO

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

☐ national ☐ state ☐ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature _____

title _____ date _____

For NPS use only

I hereby certify that this property is included in the National Register

Keeper of the National Register

date 1/22/85

Attest:

date _____

Chief of Registration

9 MAJOR BIBLIOGRAPHICAL REFERENCES

- Mattison, Ray H., "Eads Bridge," Historic Sites Survey Record, 1963.
 Smith, Shirley H., The World's Great Bridges. 1953.
 Steinmen, David B., and Sarah Ruth Watson, Bridges and Their Builders, 1941.
 Work Projects Administration, Missouri--A Guide to the "Show Me" State, 1941.
 Art Museum, Dept. of Civil Engineering, Princeton University, The Eads Bridge, 1974.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 10

UTM REFERENCES

A	1,3	7,4,6	2,4,0	4,2	7,9	1,1,0	B	1,3	7,4,4	4,8,0	4,2	7,9	3,3,0
	ZONE	EASTING		NORTHING				ZONE	EASTING		NORTHING		
C	1,3	7,4,4	2,5,0	4,2	7,8	4,5,0	D						

VERBAL BOUNDARY DESCRIPTION

The boundaries of the Eads Bridge NHL are described as follows: Beginning at the west entrance of the railroad tunnel between Clark and Spruce Streets in St. Louis, follow the tunnel north under 8th Ave., then east under Washington St. to the point where the tunnel emerges onto the lower deck of the western bridge approach. Continue east over the bridge and the eastern approach, ending at a point where the highway returns to solid ground and is no longer supported by the bridge structure.

(continued)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Stephen Lissandrello, Historian, Landmarks Survey Project - updated by Sarah J. Pearce

ORGANIZATION

Historic Sites Survey, National Park Service

DATE

March 31, 1975

National Park Service, RMR

STREET & NUMBER

1100 L Street NW

TELEPHONE

523-5464

234-2560 7/83

CITY OR TOWN

Washington, D.C.

STATE

Denver, CO

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL

STATE

LOCAL

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE

DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

**United States Department of the Interior
Heritage Conservation and Recreation Service**

**National Register of Historic Places
Inventory—Nomination Form**

Continuation sheet

Item number

10

Page

1

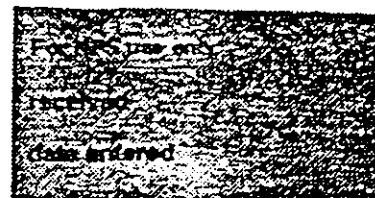
Verbal Boundary Description (continued)

The boundary is drawn to include the bridge, both approaches, the foundations and piers which extend down to the bedrock of the river, and the entire tunnel structure, extending from street level to a depth of 30 feet, and no more than 20 feet in width. The tunnel is included in the district as an integral portion of the bridge construction.

The dimensions of the district are approximately two miles in length, and 55 feet in width on the bridge, narrowing to 20 feet in the tunnel.

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form



Continuation sheet

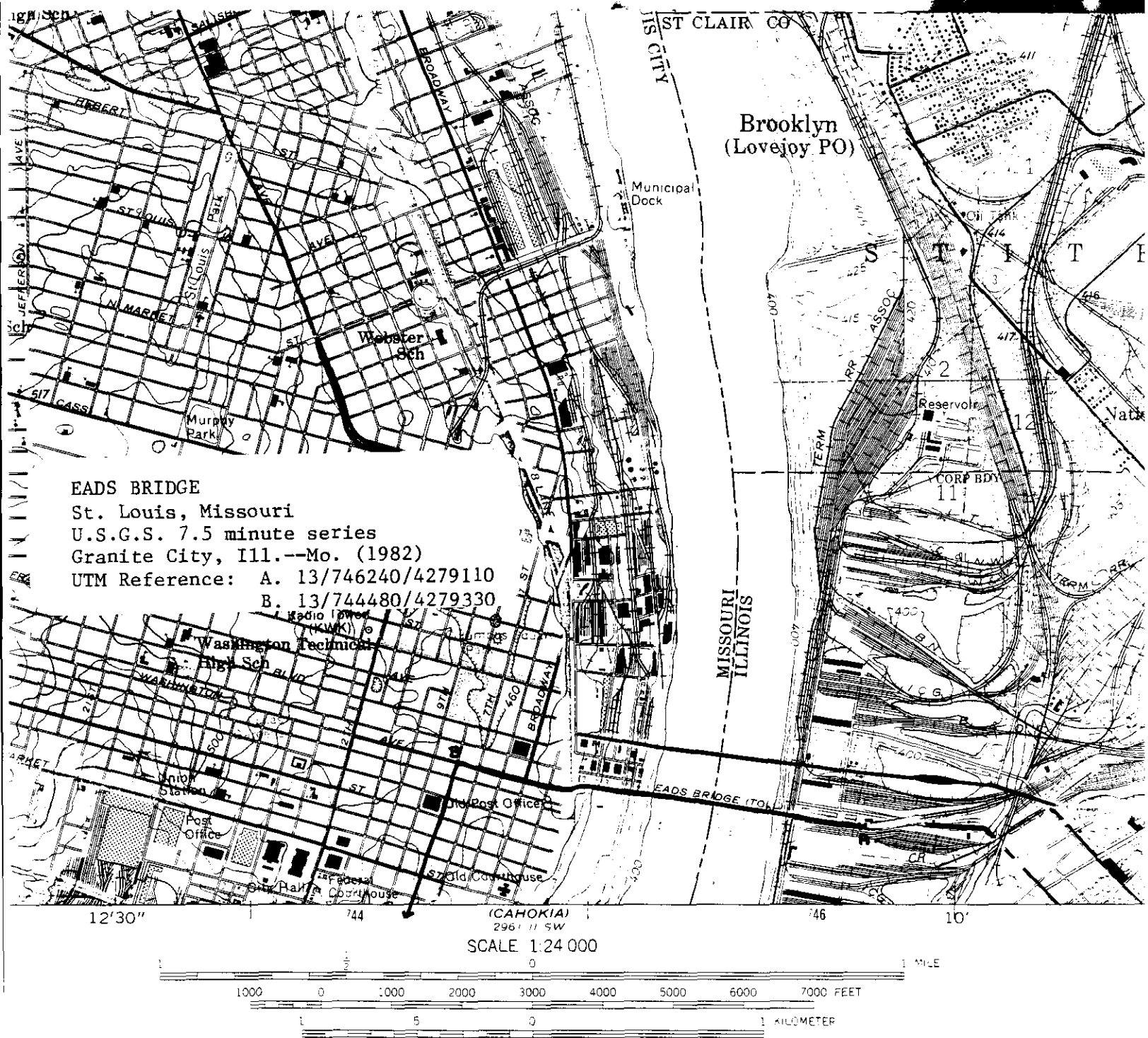
Item number 10

Page 1

Verbal Boundary Description and Justification (continued)

longer supported by the bridge structure. The boundary is drawn to include the bridge, both approaches, the foundations and piers which extend down to the bedrock of the river.

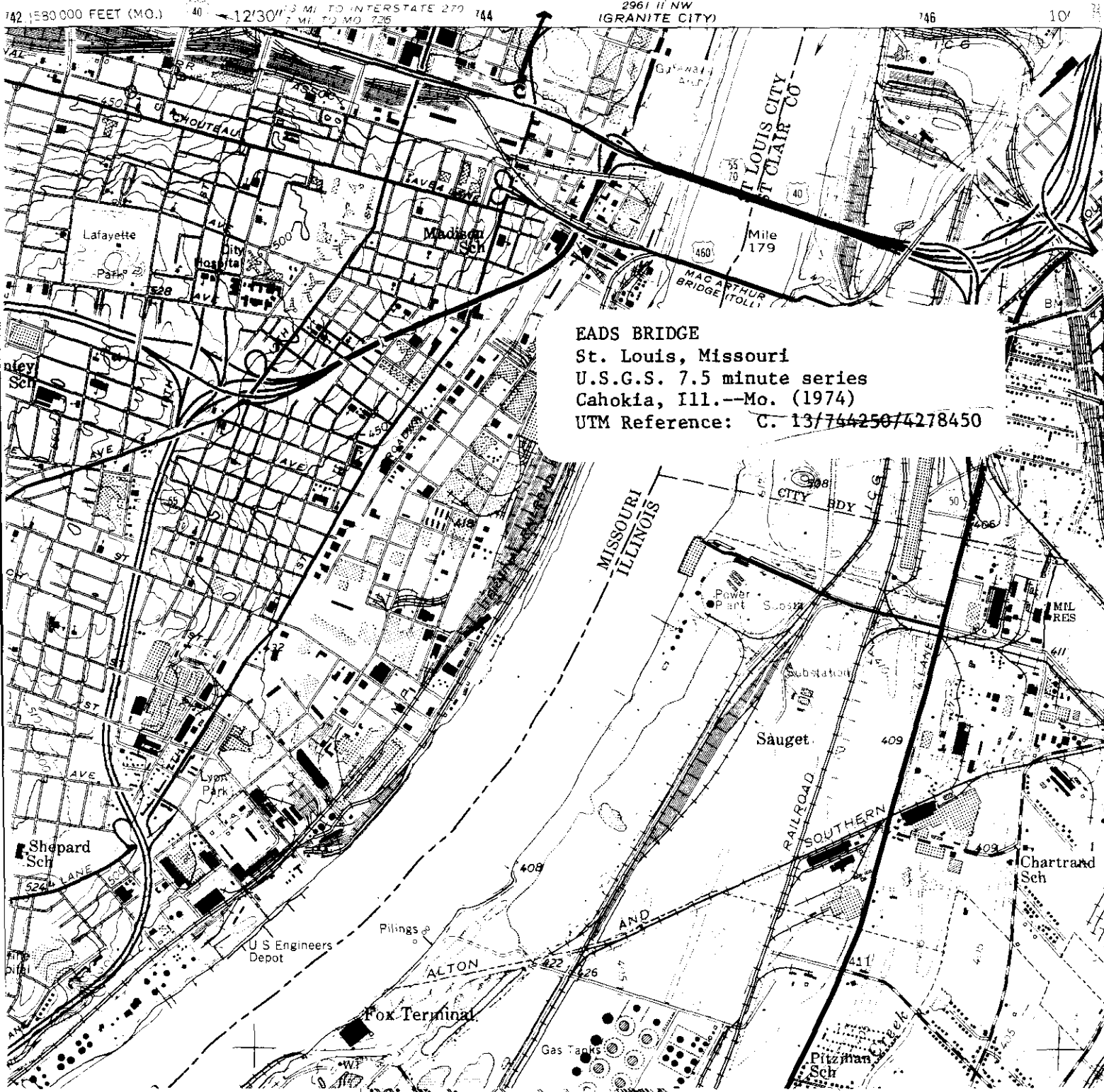
The dimensions of the structure are approximately 1 mile in length, 55 feet in width.



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092,
STATE GEOLOGICAL SURVEY, URBANA, ILLINOIS 61801,
AND THE DIVISION OF GEOLOGY AND LAND SURVEY
MISSOURI DEPARTMENT OF NATURAL RESOURCES, ROLLA, MISSOURI 65401
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

STATE OF MISSOURI
GEOLOGICAL SURVEY AND WATER RESOURCES

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION
GEOLOGICAL SURVEY



STATE OF MISSOURI
GEOLOGICAL SURVEY AND WATER RESOURCES

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION
GEOLOGICAL SURVEY

742 550 000 FEET (MO.)

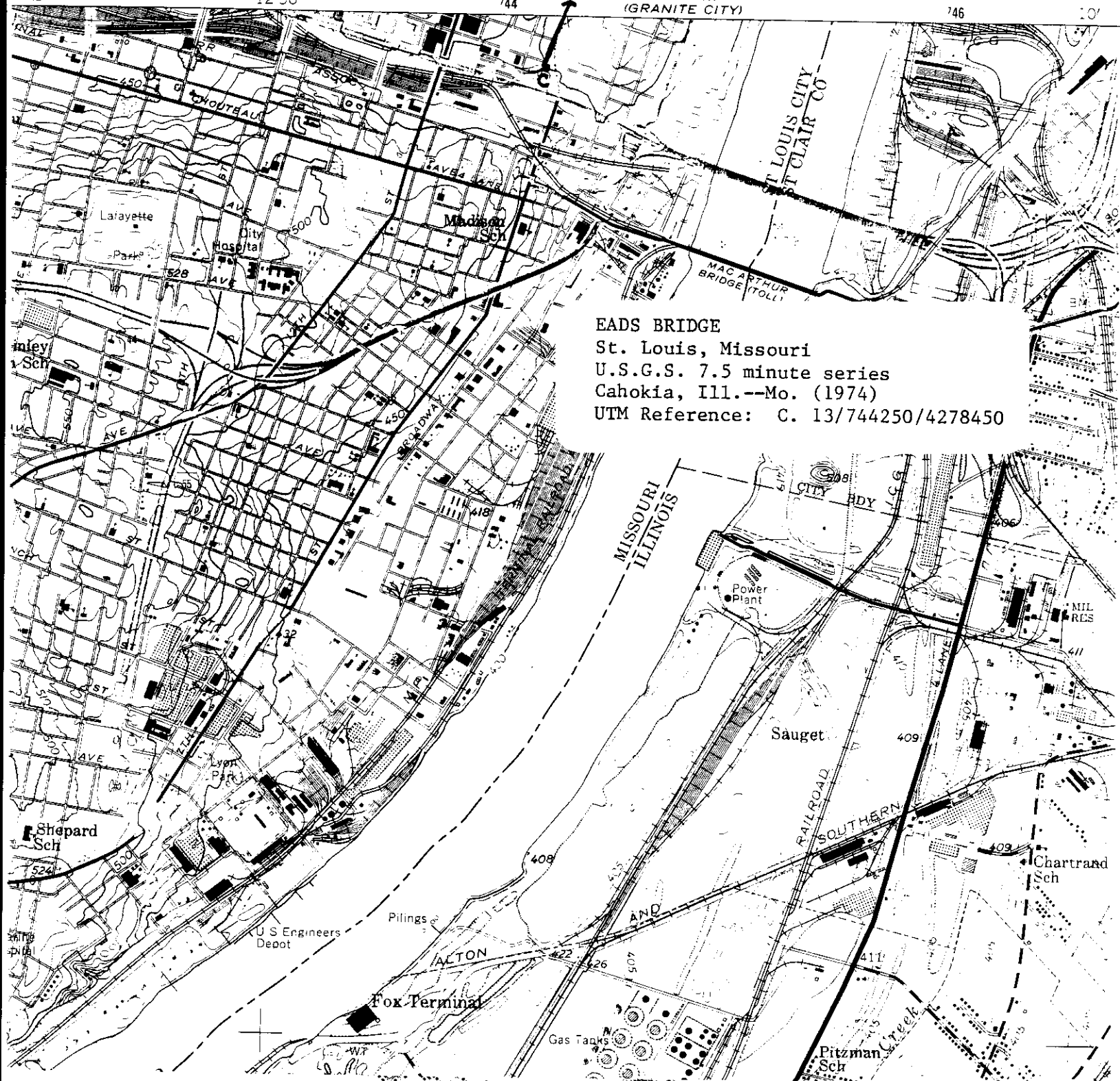
12'30"

744

2961 11 NW
(GRANITE CITY)

746

748



EADS BRIDGE

St. Louis, Missouri

U.S.G.S. 7.5 minute series

Cahokia, Ill.--Mo. (1974)

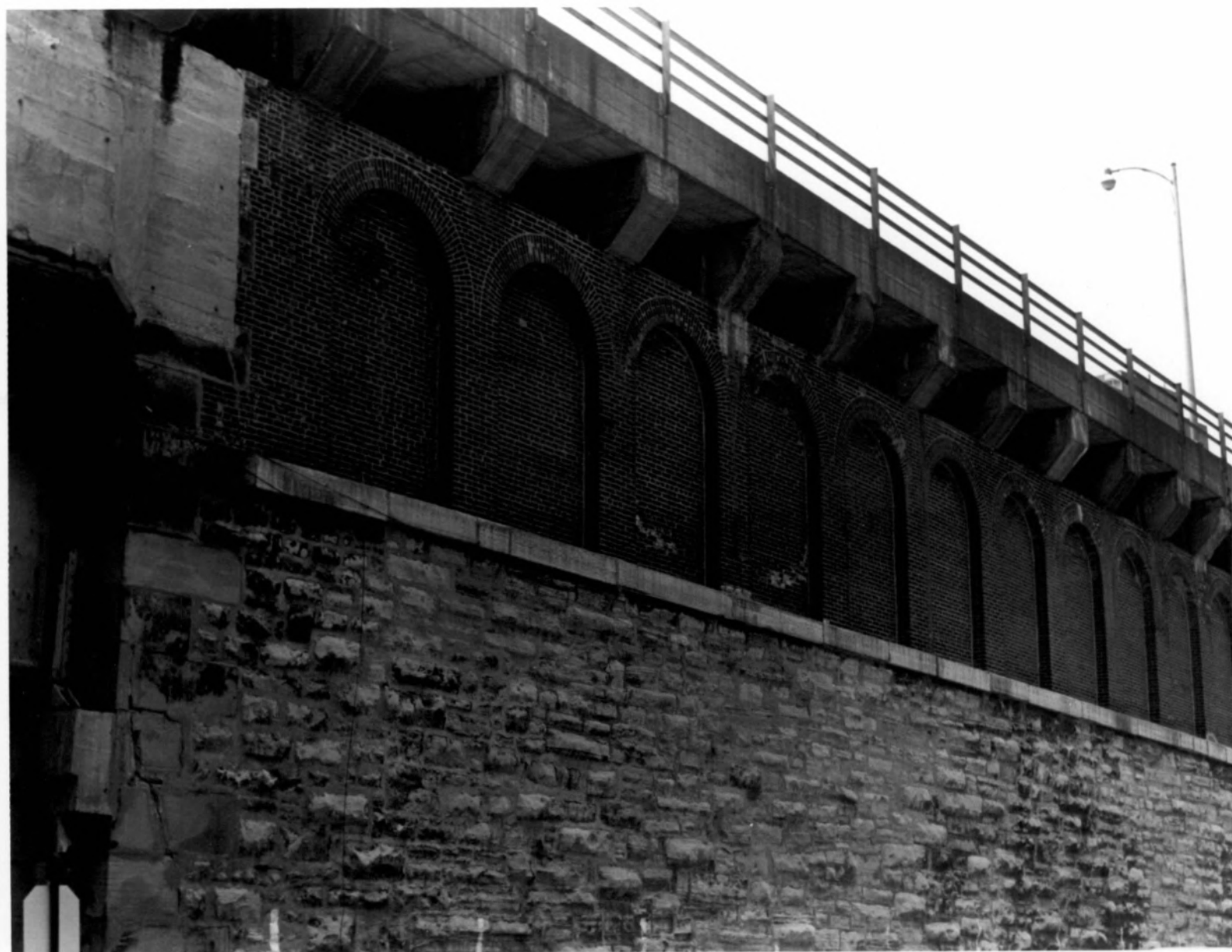
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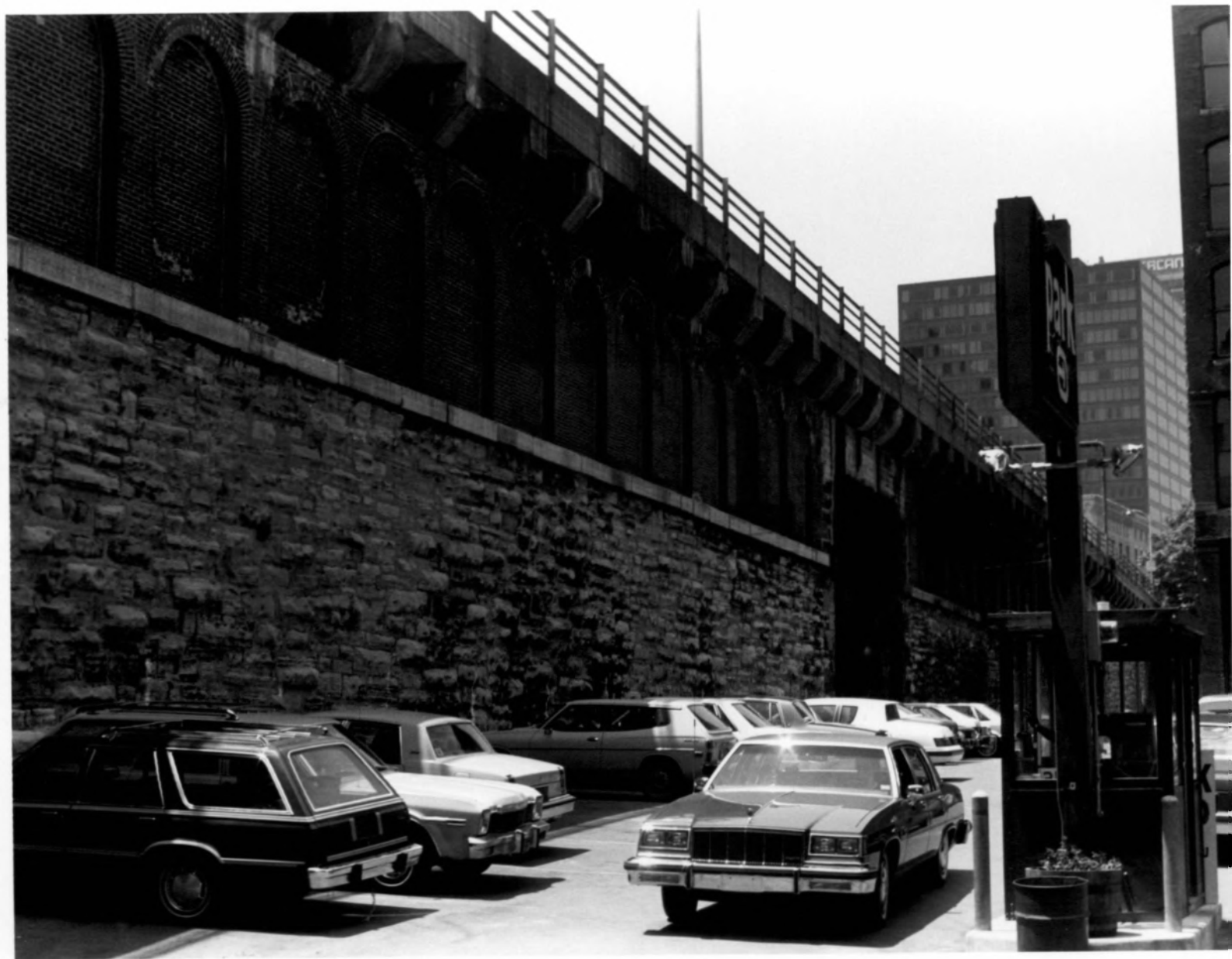
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Date: May 1983
Photographer: Michael Weichman



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Date: May 1983
Photographer: Michael Weichman



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County: City of St. Louis
Date: May 1983
Photographer: Michael Weichman



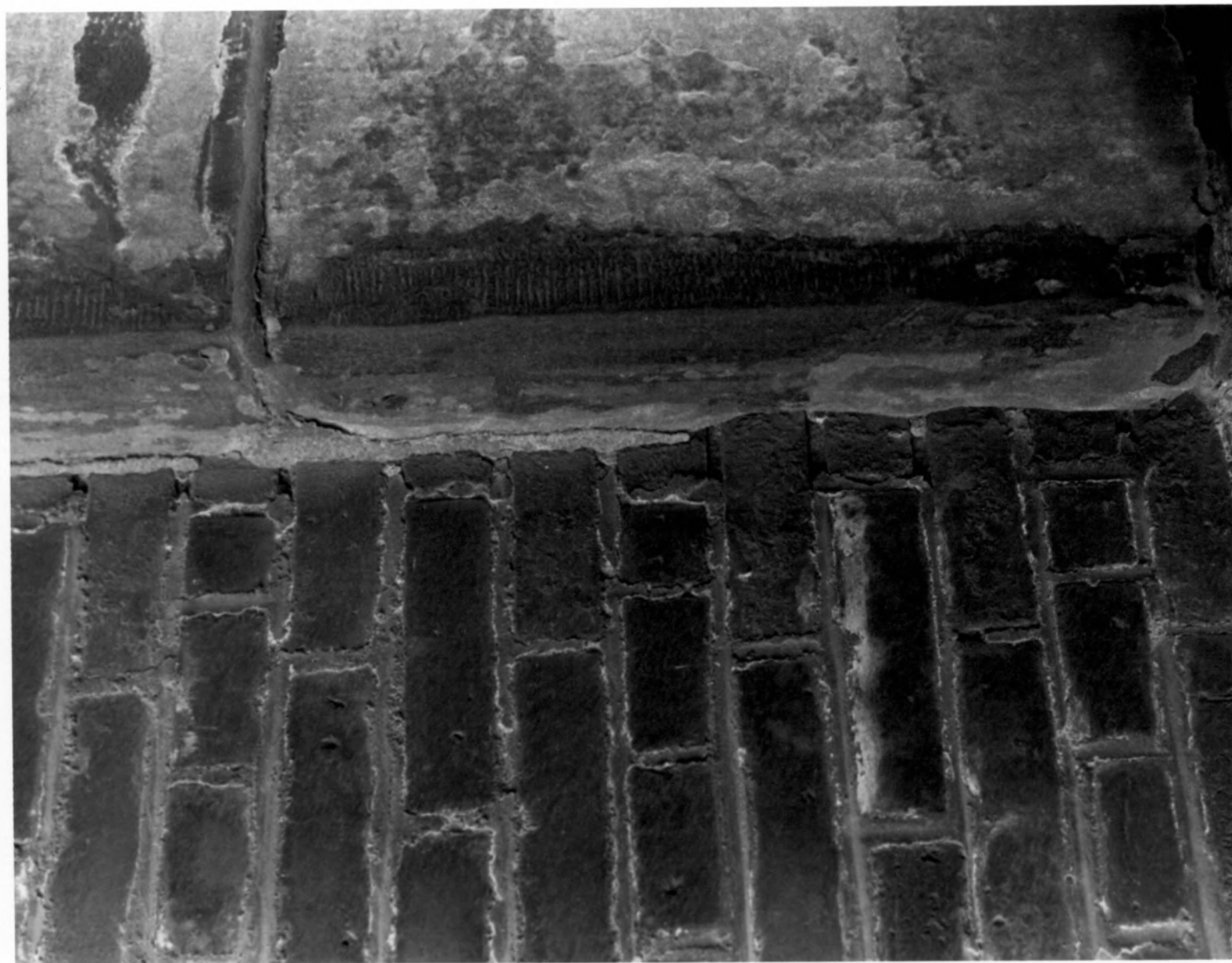
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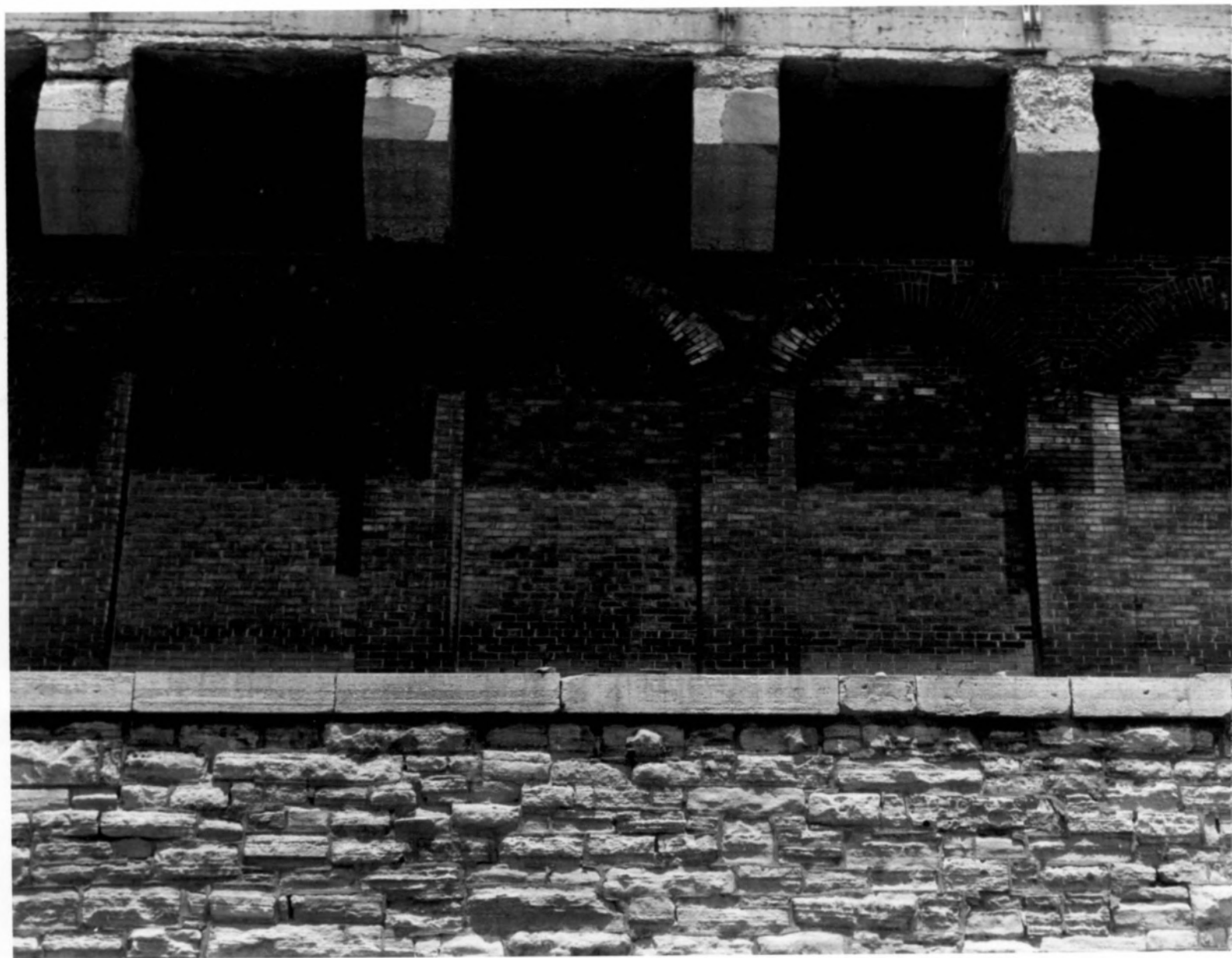
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County: City of St. Louis
Date: May 1983
Photographer: Michael Weichman



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Date: May 1983
Photographer: Michael Weichman



Site: Eads Bridge
County: City of St. Louis
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Photographer: Michael Weichman



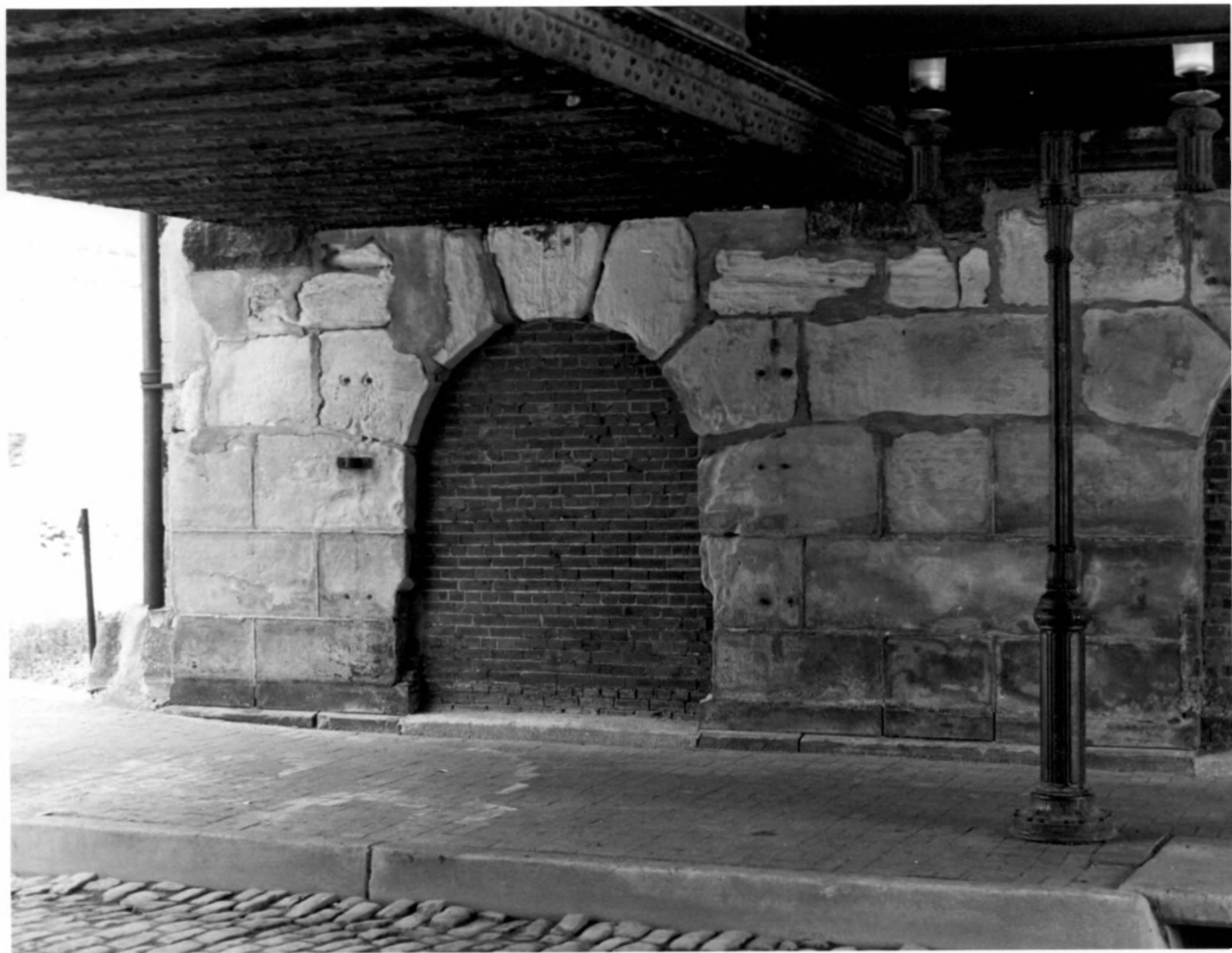
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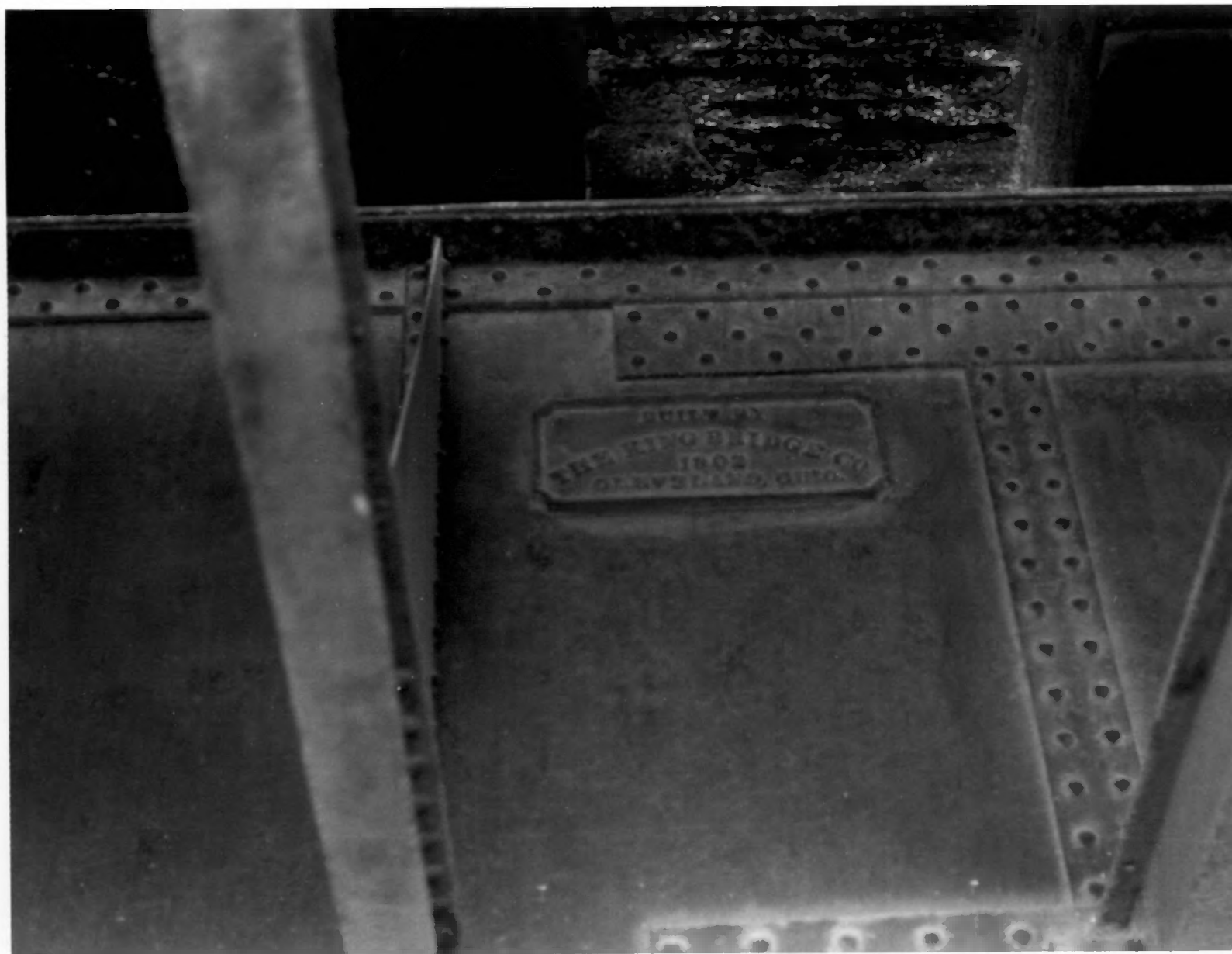
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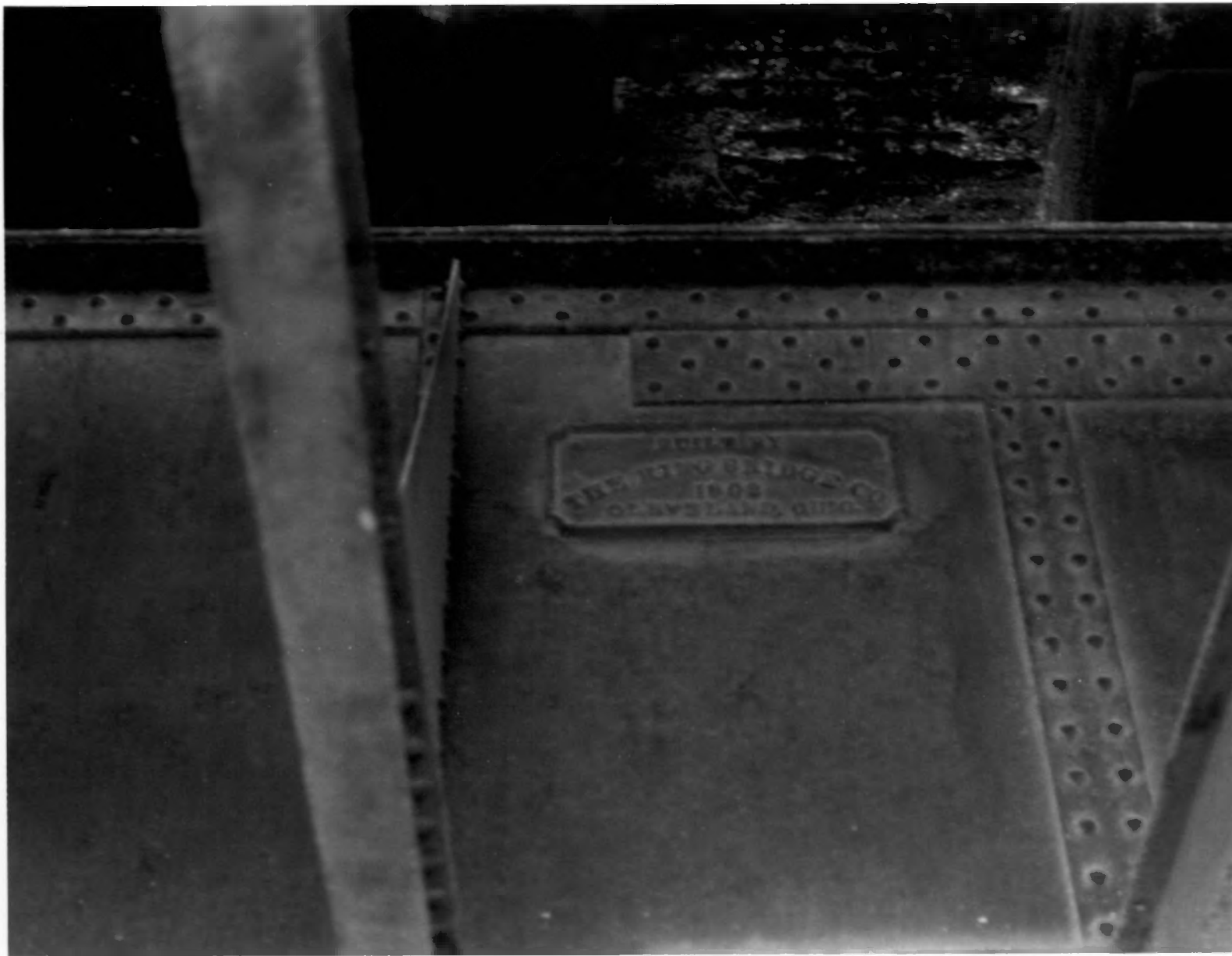
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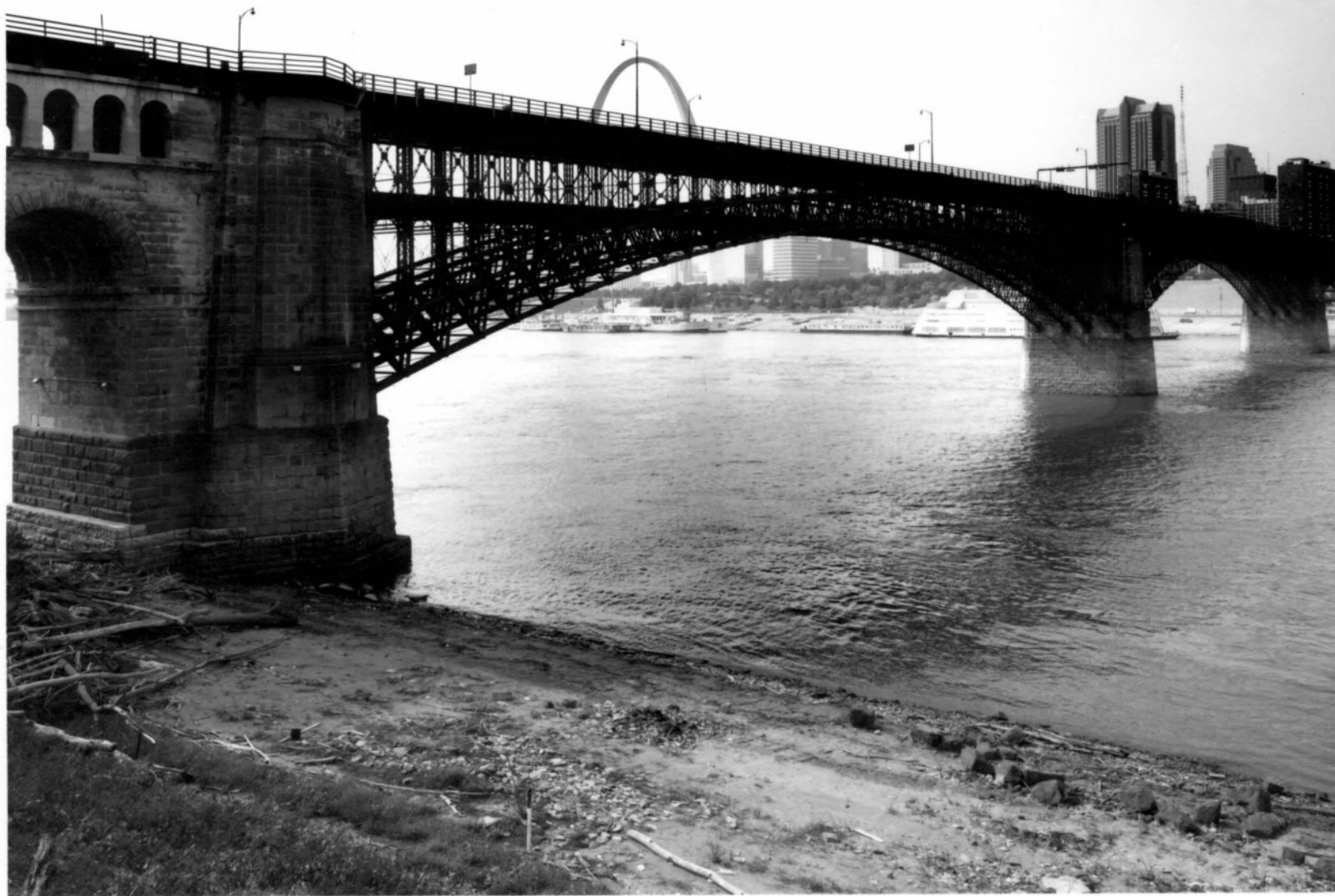
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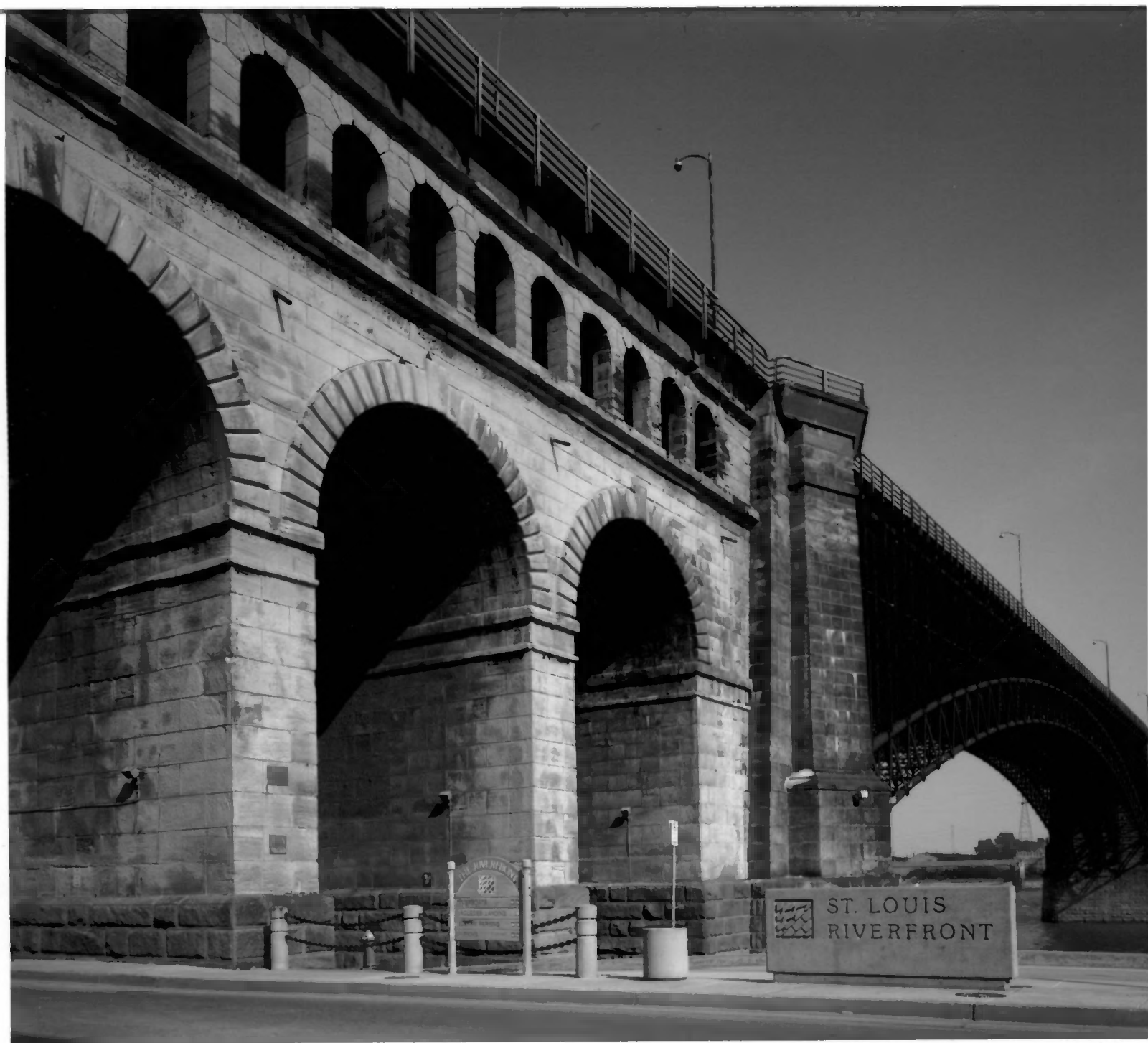


EXTRA
PHOTOS











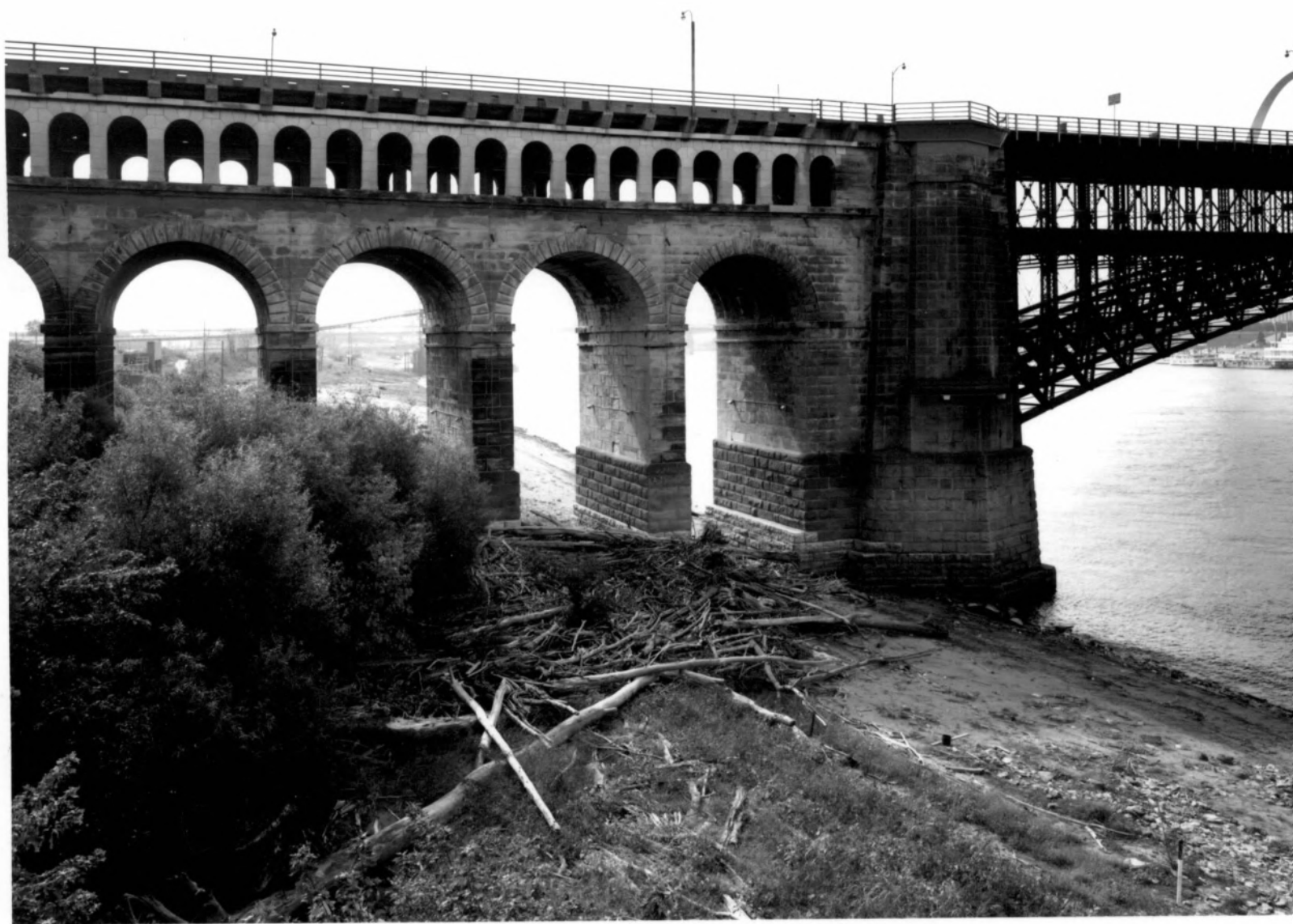


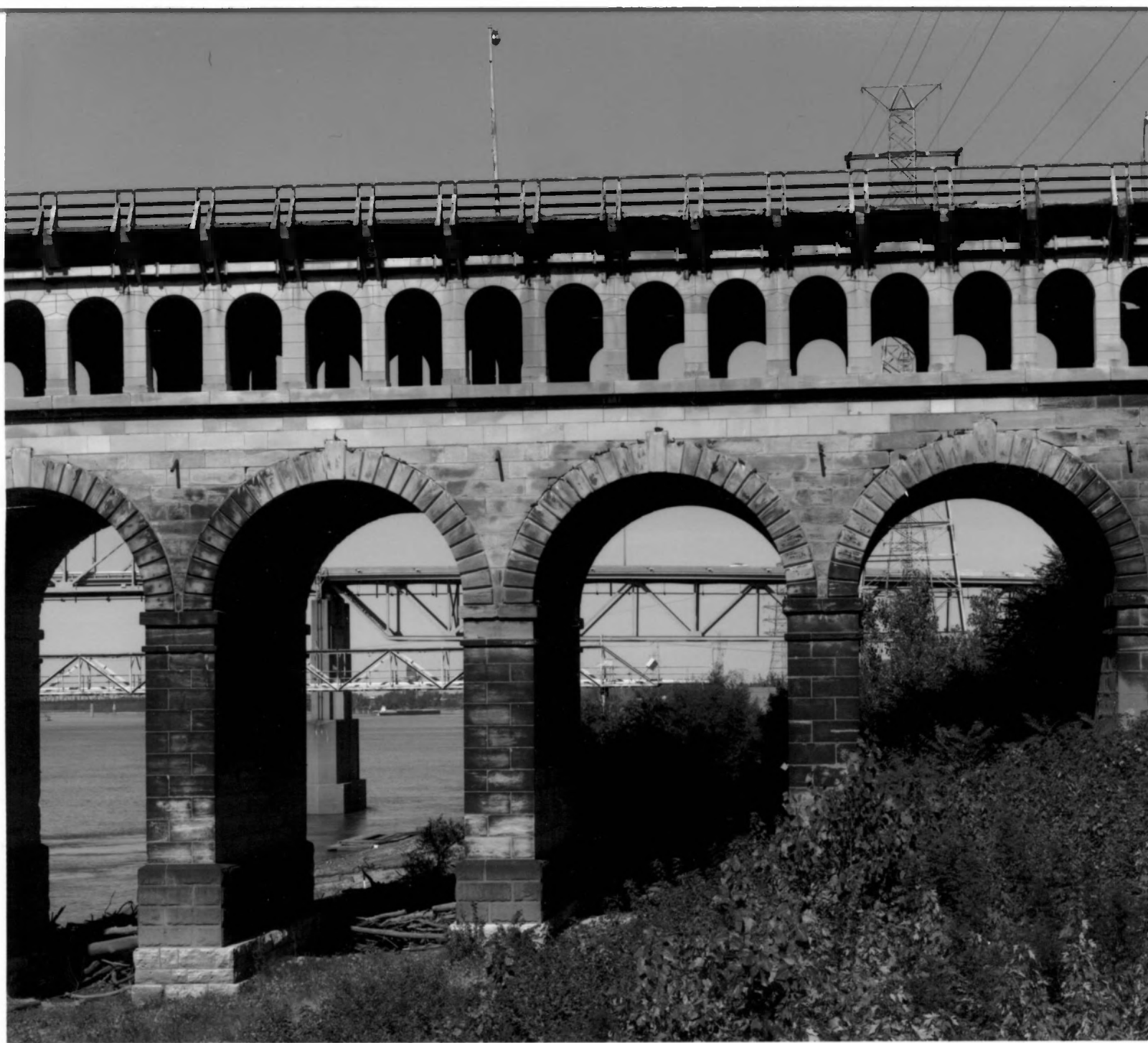


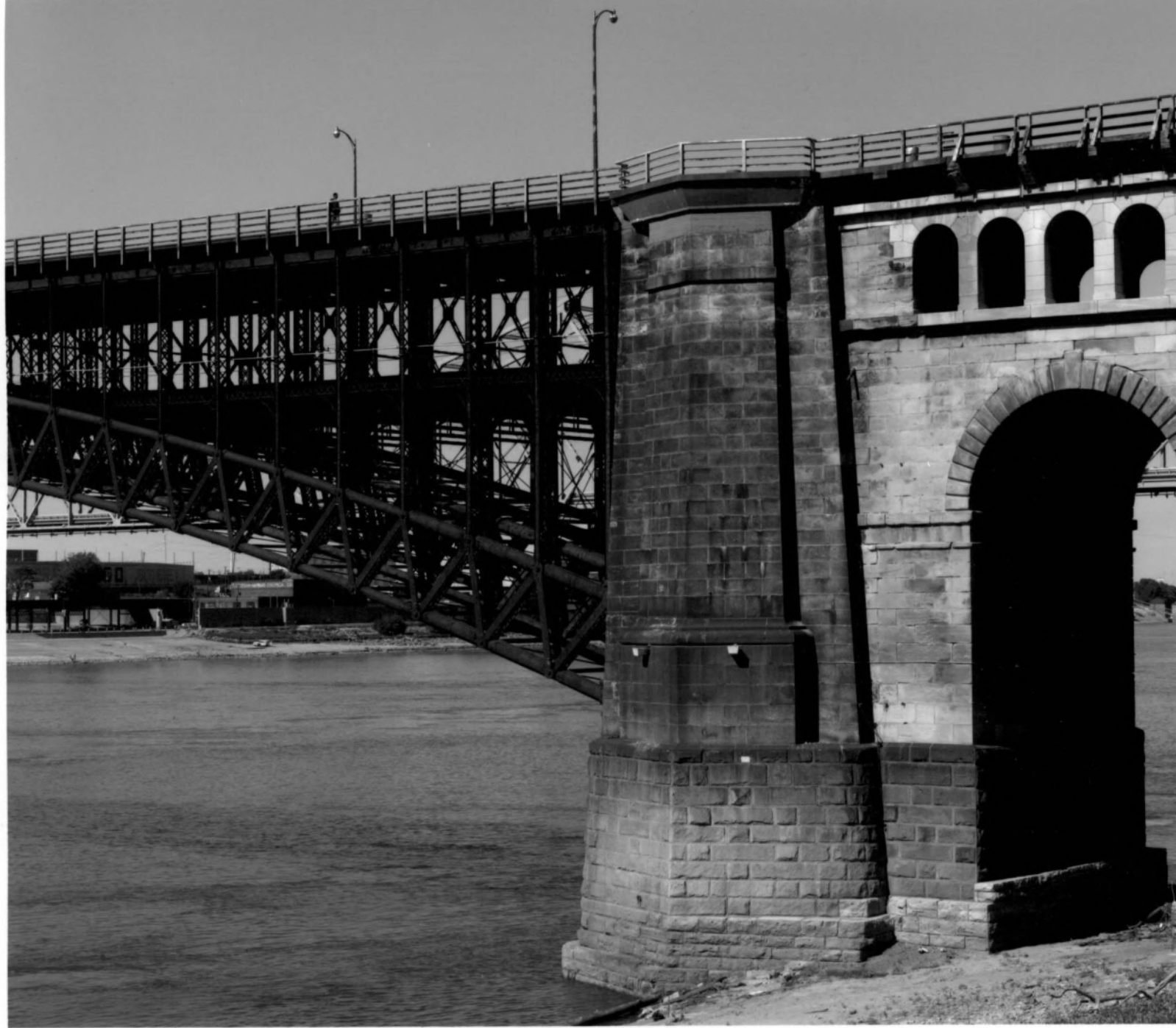






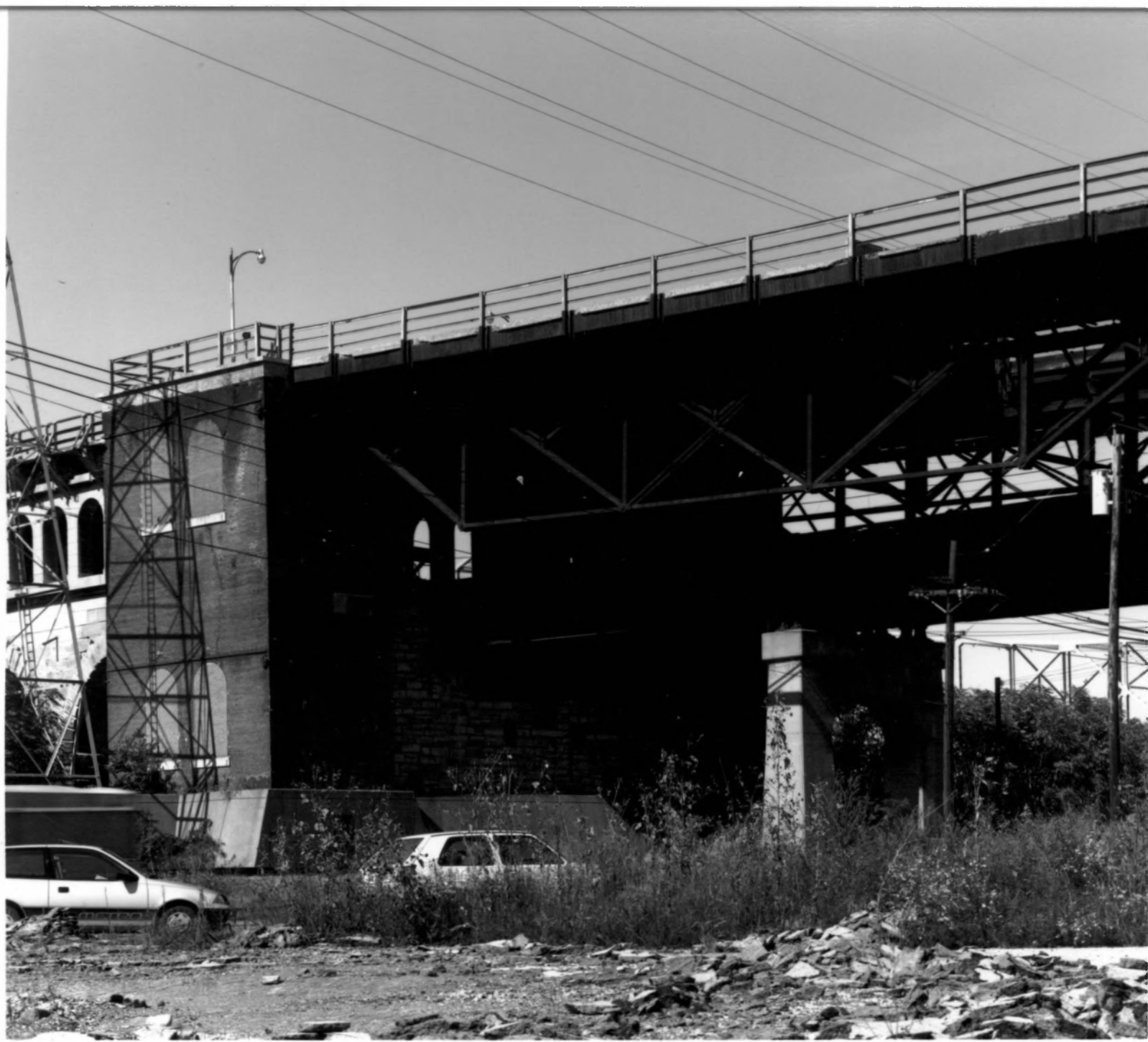












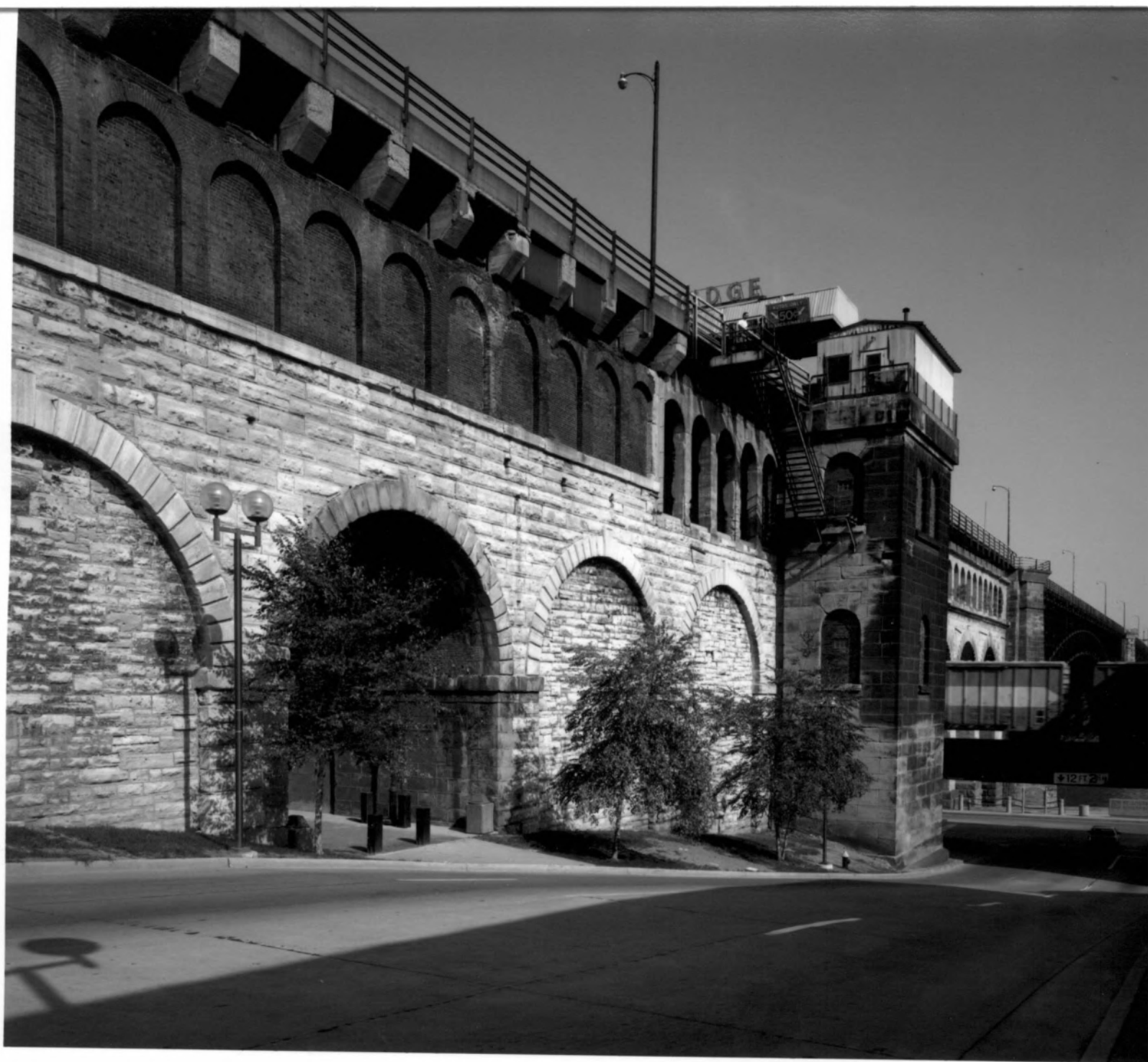


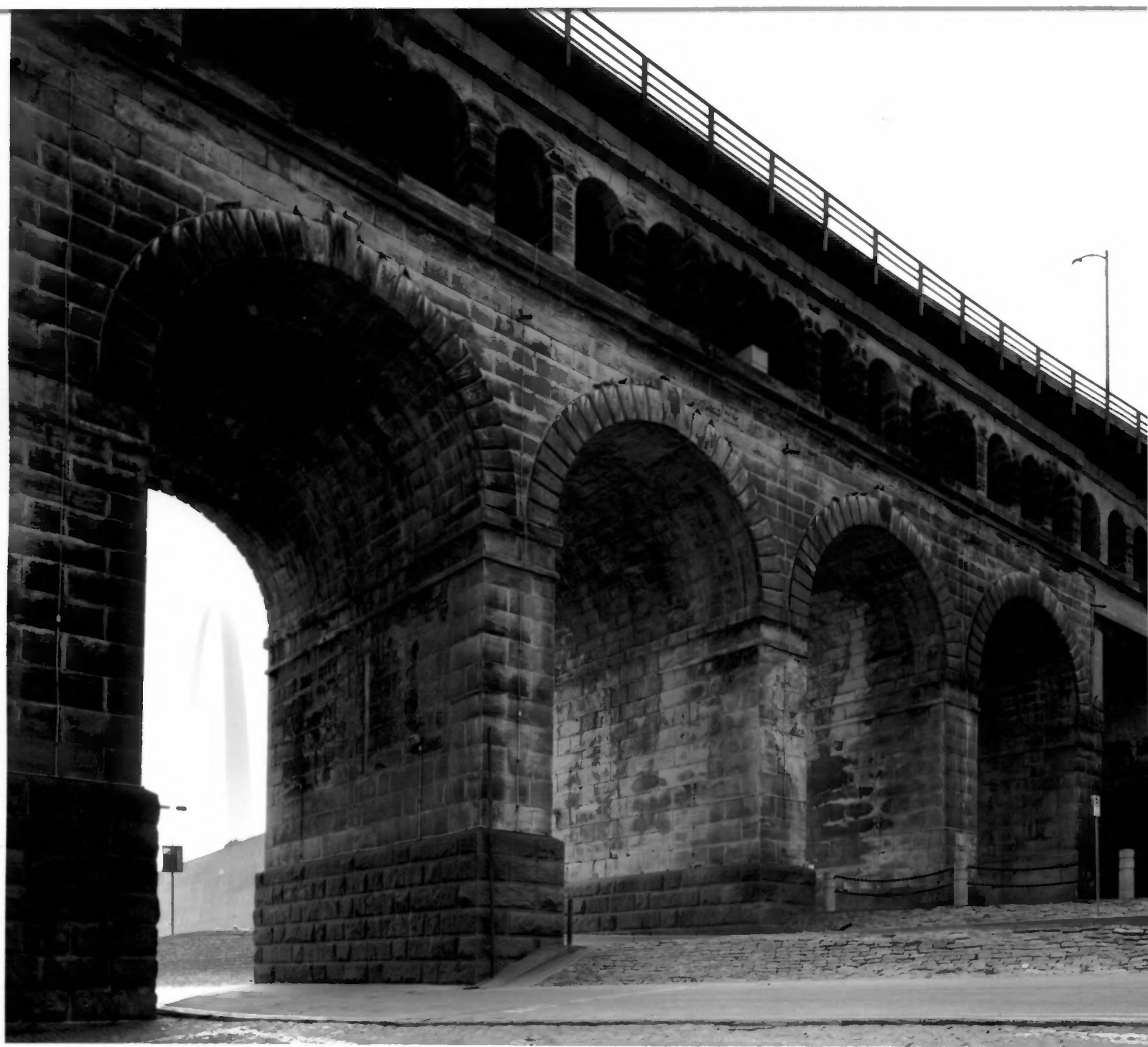


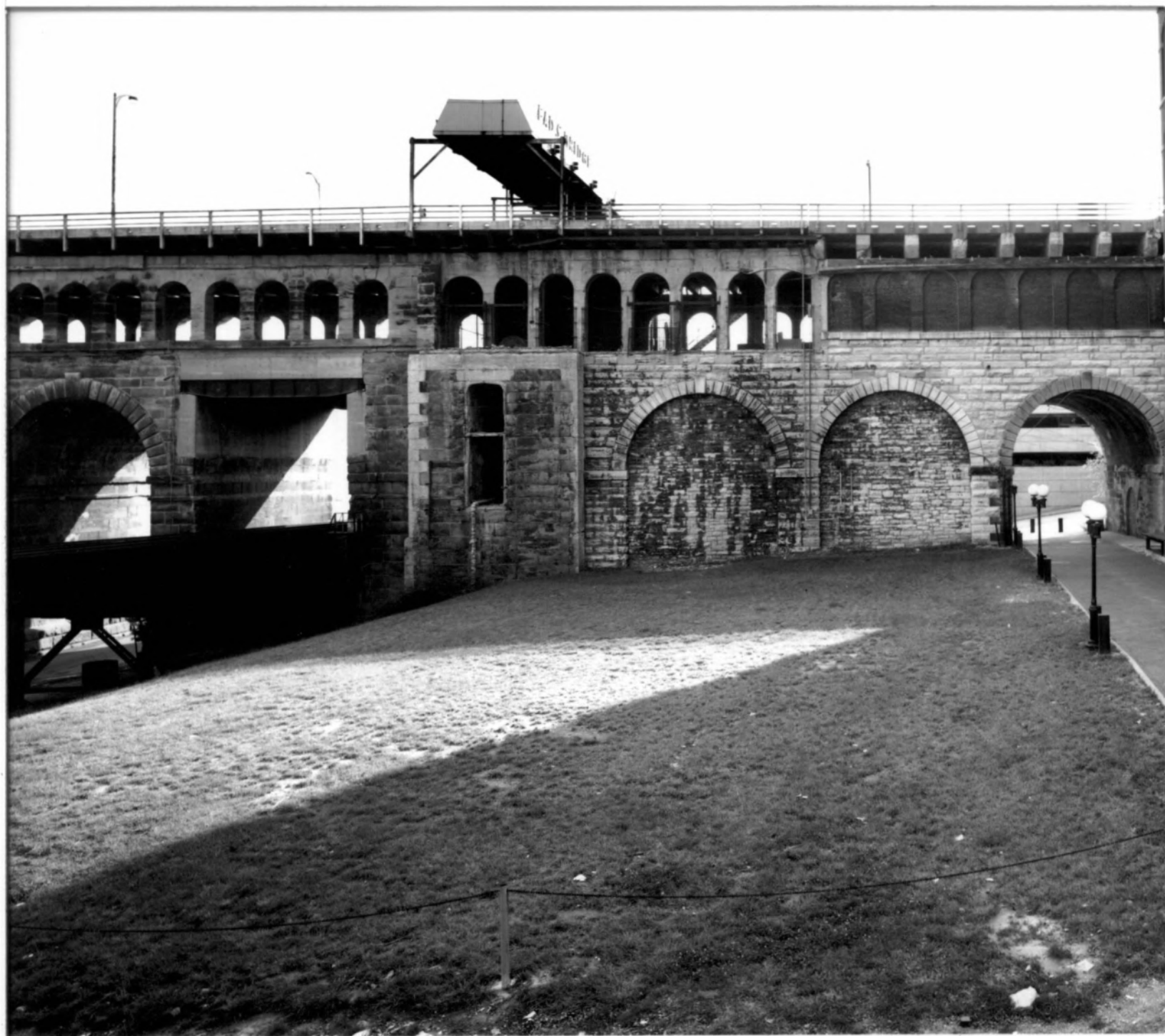










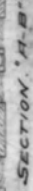




23224Z

DETAIL OF BOTTOM BEARING.

Scale $1\frac{1}{2}'' = 1'$



TERMINAL RAILROAD ASS'N.
PLAN AND SECTION OF VENTILATING CHIMNEY & FAN
FOR ST. LOUIS TUNNEL.

PLAN AND SECTION OF VENTILATING CHIMNEY & FAN
FOR ST. LOUIS TUNNEL.

PLAN AND SECTION OF VENTILATING CHANNELS FOR ST. LOUIS TUNNEL.

June 1900.

Scale 1'-1'

⑦

- ii. identical values only